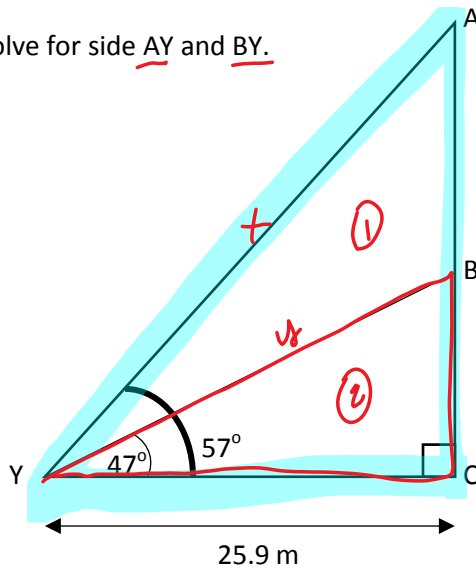


## 5.6 Solving Double Triangles

Example 1: Solve for side AY and BY.



∴ Side  $x$  is 47.6 m and side  $y$  is 38.0 m

$\Delta 1$

$$\cos \theta = \frac{A}{H}$$

$$\cos 57^\circ = \frac{25.9}{x}$$

$$\frac{1}{\cos 57^\circ} = \frac{x}{25.9}$$

$$x = \frac{25.9}{\cos 57^\circ}$$

$$x = 47.6$$

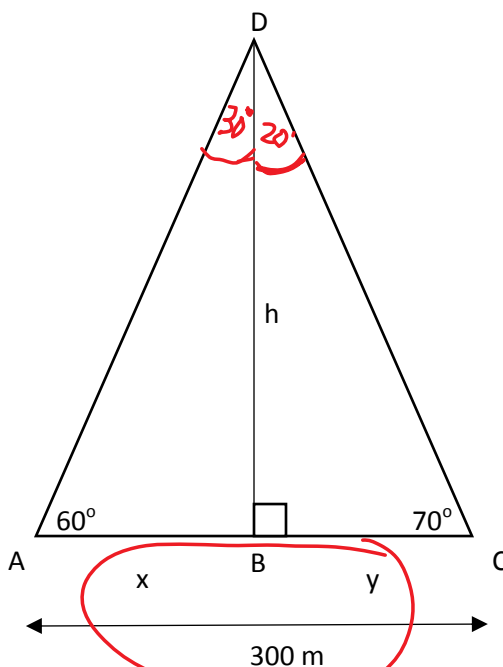
$\Delta 2$

$$\cos 47^\circ = \frac{25.9}{y}$$

$$y = \frac{25.9}{\cos 47^\circ}$$

$$y = 38.0$$

Example 2: Find the height of the triangle, to the nearest metre.



$$x + y = 300$$

$\Delta ABD$

$$\tan 30^\circ = \frac{x}{h}$$

$$x = h \tan 30^\circ$$

$\Delta CBD$

$$\tan 20^\circ = \frac{y}{h}$$

$$y = h \tan 20^\circ$$

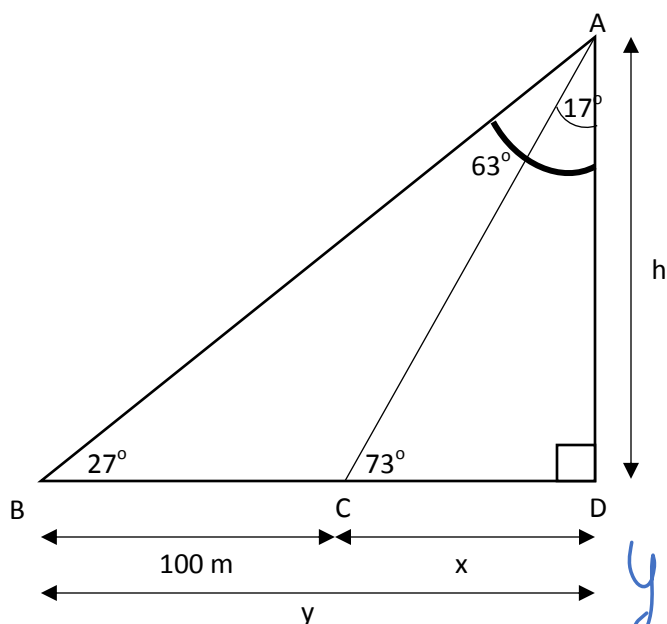
$$x + y = 300$$

$$h \tan 30^\circ + h \tan 20^\circ = 300$$

$$\frac{h(\tan 30^\circ + \tan 20^\circ)}{(\tan 30^\circ + \tan 20^\circ)} = \frac{300}{(\tan 30^\circ + \tan 20^\circ)}$$

$$h = 318.7$$

Example 3: Find the height of the triangle



$\triangle ABD$

$$\tan 63^\circ = \frac{y}{h}$$

$$y = h \tan 63^\circ$$

$\triangle ACD$

$$\tan 17^\circ = \frac{x}{h}$$

$$x = h \tan 17^\circ$$

$$y = x + 100$$

$$y - x = 100$$

$$h \tan 63^\circ - h \tan 17^\circ = 100$$

$$h (\tan 63^\circ - \tan 17^\circ) = 100$$

$$\frac{h (\tan 63^\circ - \tan 17^\circ)}{(\tan 63^\circ - \tan 17^\circ)} = \frac{100}{(\tan 63^\circ - \tan 17^\circ)}$$

$$h = 60$$

∴ the height of the  $\triangle$  is 60 m.

Assigned Work: p. 413-414 #11, 15 and p. 417 # 14\*, 15, 16